STATE OF ALABAMA
SURFACE MINING COMMISSION

Permit Number:P- 3999

License Number:L- 755

PERMIT TO ENGAGE IN SURFACE COAL MINING OPERATIONS

Pursuant to **The Alabama Surface Mining Control and Reclamation Act of 1981,** as amended, **ALA. Code** Section 9-16-70 et. seq. (1975) a permit to engage in Surface Coal Mining Operations in the State of Alabama is hereby granted to:

Cahaba Resources, LLC.
P.O. Box 122
Vance, AL 35444

Such operations are restricted to 204 acres as defined on the permit map and located in:

"See attachment for legal description"

This permit is subject to suspension or revocation upon violation of any of the following conditions:

1. The permittee shall conduct Surface Coal Mining and Reclamation Operations in accordance with the plans, provisions and schedules in the permit application.

2. The permittee shall conduct operations in a manner to prevent damage or harm to the environment and public health and safety and shall notify ASMC and the public in accordance with ASMC Rule 880-X-8K-.10 of any condition which threatens the environment or public health and safety.

LEGAL DESCRIPTION
P-3999-63-26-S

NW,SE, SW/NE, NW/NE, NE/SW, SW/SW, NW/SW, NE/NW, SE/NW, SW/NW, NW/NW of Section 19, Township 20 South, Range 6 West; SE/NE, NE/SE, SE/SE, SW/SE of Section 24, Township 20 South, Range 7 West, Tuscaloosa County, Alabama.

CONDITIONS TO BE PLACED ON PERMIT P-3999-63-26-S PAGE #1

3. Surface coal mining operations are restricted to those areas for which sufficient bond has been posted with ASMC. On the date of issuance of this permit, bond was posted only for increment 6 consisting of 6 acres as defined on the permit map.

4. No mining disturbance is to occur on any part of the permit on which legal "right of entry" has not been obtained. When such rights are "pending" the applicant shall submit acceptable evidence, to the Director, that such rights have been obtained according to ASMC Regulation 880-X-8D-.07.

5. No disturbance is to occur on any properties on which land use comments from legal owners of record are "pending" prior to the applicant providing acceptable comments.

6. No disturbance is to occur in the 300' setback area to any occupied dwelling prior to the applicant providing acceptable evidence to ASMC of its having secured a waiver of each subject area signed by the owner of the dwelling.

7. No mining disturbance shall occur within the l00' setback of any public road or the relocation of any public road prior to the applicant providing acceptable evidence, to the Director, of its having secured approval for a waiver from the appropriate jurisdictional authority and specific written waiver from ASMC.

8. The permittee shall notify the ASMC and seek consultation with the US Fish and Wildlife Service if:
   a. The permit is modified in any way that causes an effect on species or Critical Habitat listed under the Endangered Species Act of 1973.
   b. New information reveals the operation may affect Federally protected species or designated Critical Habitat in a manner or extent not previously considered or
   c. A new species is listed or Critical Habitat is designated under the Endangered Species Act that may be affected by the operation.

9. The permittee shall contact the ASMC and consult with the Alabama Historic Preservation Officer if the permit is modified or if previously unknown archaeological or historic resources are discovered on the permit area. Upon discovery of previously unknown artifacts or archaeological features the permittee shall cease operations until the Alabama Historic Preservation Officer approves resumption of operations.

10. The permittee must conduct all tree removal activities for the project prior to May 28, 2024. If tree removal is required after May 28, 2024 a new Threatened and Endangered/Critical Habitat survey must be conducted and FWS approval submitted to ASMC prior to tree removal.

CONDITIONS TO BE PLACED ON PERMIT P-3999-63-26-S PAGE #1

11. The MSHA permit must be issued and provided to the Alabama Surface Mining Commission before any mining active is conducted.

DATE ISSUED: **February 18, 2021**

EFFECTIVE DATE: **February 18, 2021**

EXPIRATION DATE: **February 17, 2026**

SM 2/18/2021

Kathy H. Love

Kathy H. Love, Director

FINDINGS TO BE PLACED ON PERMIT NO.: P-3999-63-26-S PAGE #1

The ASMC, acting by and through its Director, hereby finds, on the basis of information set forth in the application or from information otherwise available, that --

1. The permit application is complete and accurate and the applicant has complied with all requirements of the Act and the regulatory program.

2. The applicant has demonstrated that reclamation as required by the Act and the regulatory program can be accomplished under the reclamation plan contained in the permit application.

3. The proposed permit area is:

   (a) Not within an area under study or administrative proceedings under a petition, filed pursuant to Chapter 880-X-7 to have an area designated as unsuitable for surface coal mining operations;

   (b) Not within an area designated as unsuitable for mining pursuant to Chapter 880-X-7 or subject to the prohibitions or limitations of Section 880-X-7B.-06 and Section 880-X-7B-.07 of this chapter; or

4. For mining operations where the private mineral estate to be mined has been severed from the private surface estate, the applicant has submitted to the Regulatory Authority the documentation required under Section 880-X-8D.07 and Section 880-X-8G-.07 of this chapter.

5. The Regulatory Authority has made an assessment of the probable cumulative impacts of all anticipated coal mining on the hydrologic balance in the cumulative impact area and has determined that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

6. The applicant has demonstrated that any existing structure will comply with Section 880-X-2B-.01, and the applicable performance standards of Chapter 3 or 10.

7. The applicant has paid all reclamation fees from previous and existing operations as required by 30 C.F.R., Subchapter R.

8. The applicant has satisfied the applicable requirements of Subchapter 880-X-8J.

9. The applicant has, if applicable, satisfied the requirements for approval of a long-term, intensive agricultural, post-mining land use, in accordance with the requirements of 880-X-l0C-.58(4) and 880-X-10D-.52(4).

10. The operation will not affect the continued existence of endangered or threatened species, or result in destruction or adverse modification of their critical habitats, as determined under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).

11. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources, or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary.

12. For a proposed remining operation where the applicant intends to reclaim in accordance with the requirements of Section 880-X-l0C-.56 or 880-X-10D.-49, the site of the operation is a previously mined area as defined in Section 880-X-2A-.06.

13. Surface coal mining and reclamation operations will not adversely affect a cemetery.

14. After application approval but prior to issue of permit, ASMC reconsidered its approval, based on the compliance review required by Section 880-X-8K-.10(2)(a) in light of any new information submitted under 880-X-8D-.05(8).

15. The applicant has submitted the performance bond or other equivalent guarantee required under Chapter 880-X-9 of the ASMC Rules prior to the issuance of the permit.

16. For mining operations where a waiver is granted from the 100' setback from a public road according to 880-X-7B-.07, the interests of the public and affected landowners have been protected.

17. The Regulatory Authority has taken into account the effect of the proposed permitting action on properties listed or eligible for listing on the National Register of Historic Places (NRHP). MRS Consultants, LLC conducted a Phase I Cultural Resource Survey on February 6 – March 12, 2019 for approximately 773 acres in Tuscaloosa County, Alabama. As a result of these investigations, three archaeological sites were discovered within the survey area. Designated as sites 1Tul147, 1Tul148, and 1Tul149, two of the sites consist of poured concrete structures (1Tul147 and 1Tul148). These sites are likely associated with previous mining activity. Site 1Tul149 is a sparse density, prehistoric lithic scatter identified adjacent to an eroded access road. None of these sites are considered eligible for the NRHP and no further work is recommended. Based on these findings, MRS recommends clearance of the proposed Cahaba Resources, Rockcastle Mine in Tuscaloosa County, Alabama. The proposed undertaking should have no effect upon any significant historic properties for direct or indirect effect. By a letter dated May 10, 2019 the Alabama Historic Commission (AHC) requested additional information regarding the cultural resources survey of the proposed Rockcastle Mine and more specifically the identified cultural resources 1Tul147 and 1Tul148. MRS performed a supplemental investigation, photo documentation and mapping on June 11. By letter dated August 2, 2019 Re: AHC 2019-0763, upon review of the revised cultural resource assessment conducted for the above referenced project, determined that the project activities will have no effect on cultural resources eligible for or listed on the NRHP including archaeological sites 1Tul147, 1Tul148 and 1Tul149. Therefore AHC concurs with the proposed project activities. This finding is supported in part by inclusion of appropriate permit conditions or changes in the operation plan protecting historic resources or a documented decision that the Regulatory Authority has determined that no additional protection measures are necessary. Concerns for unknown resources, which might be discovered during mining, have been made conditions of the permit.

18. In a letter dated January 18, 2018 the Alabama Department of Conservation and Natural Resources (ADCNR) states that a biological survey be conducted by trained professionals to ensure that no sensitive species are jeopardized by the development activities. The closest sensitive species are recorded as occurring approximately 6 miles from the subject site. In a habitat assessment performed by McGehee Engineering Corp (MEC) in March, July, and November of 2018 and January and February of 2019, no habitat found for the listed, threatened and endangered species and that no evidence was found or observed for the presence or possible presence of the species with the exception of acres of potential summer roosting habitat for the Indiana bat (*Myotis sodalis)* and Northern Long-eared (NLEB) bat (*Myotis septentrionalis).* MEC stated that tree removal activities would be limited to October 15 – March 31. In the event that timber removal is necessary outside the recommended timber harvesting timeframe of October 15th through March 31st, Cahaba Resources, LLC conduct and get approval of a Presence/Absence Survey prior to any disturbance within the designated potential habitat areas. By comments dated March 21, 2019 the US Fish and Wildlife Service (FWS) acknowledges the permittee has stated that tree removal is only to occur between October 15 and March 31, therefore FWS concurs that no impacts to the Indiana bat and/or NLEB are anticipated as a result

of your proposed project. No other federally listed species/critical habitat are known to occur in the project area. MEC conducted an Acoustic Presence/Absence Survey for the Indiana and Northern Long-eared bats from May 20th – 28th, 2019. The findings of the Acoustic Presence/Absence Survey conducted by MEC indicate the presence of the Indiana bat and NLEB **UNLIKELY**. By comments dated June 25, 2019 FWS concurred with the determination of probable absence of the Indiana and NLEB and acknowledge the survey is valid for five years form the date of completion of the survey unless new information suggests otherwise. By letter dated February 27, 2020 the US Army Corps of Engineers (USACE) Nationwide Permit 49- Project Number SAM-2018-01273-CMS states the project will involve the placement of fill into 613 linear feet (lf) of intermittent stream, 0.67 acres of wetlands and 6.54 acres of open waters incidental to surface coal re-mining activities. Based upon the Pre- Construction Notification (PCN) the USACE has issued the following special condition: 1) Provide a net increase in aquatic resource functions when mining is complete, reclamation of water of the U.S. on the project site shall be conducted in accordance with the "Ecological Lift/Aquatic Resources Restoration Plan" Plan dated July 2019. The plan shall be implemented concurrent with ASMC reclamation. The Alabama Surface Mining Commission finds that the proposed operation will not jeopardize the continued existence of endangered or threatened species or critical habitat thereof.

19. The proposed permit area is:
    a. Not within an area under study or administrative proceedings under a petition, filed pursuant to Chapter 880-X-7 to have an area designated as unsuitable for surface coal mining operations.
    b. Not within an area designated as unsuitable for mining pursuant to Chapter 880-X-7 or subject to the prohibitions or limitations of Section 880-X-7B-.06 and Section 880-X-7B.-07 of this chapter.

BASED ON THESE FINDINGS, I RECOMMEND THAT THIS PERMIT BE ISSUED.

DATE: February 18, 2021

Mark Woodley
Mark A. Woodley
Permit Manager

/mw
cc: I & E, Permit File

MEMORANDUM

TO: Office of Surface Mining Reclamation and Enforcement

Alabama Department of Environmental Management

Alabama Historic Preservation Officer

The District Engineer
U.S. Corps of Engineers

Alabama Department of Labor
Division of Safety & Inspection

BLM - District Office

State of Alabama
Abandoned Mine Land Reclamation

Tuscaloosa County Commission

U.S. Fish & Wildlife Service

Mr. Keith Guyse, Fish & Game Division

FROM: KATHY H. LOVE, DIRECTOR

RE: **PERMANENT PROGRAM PERMIT FOR:**

Permit P-3999-63-26-S (Rockcastle Mine No. 1) Cahaba Resources, LLC

Pursuant to the Alabama Surface Mining Commission Regulation 880-X-8K-.12(2), we are hereby notifying you of the issuance of the above permit.

You may also view a copy of this permit at our web address of:

http://surface-mining.alabama.gov/PermitDecisions.html

Enclosed for your information and file is a copy of the permit which shows the legal description of the mine site.

/mw

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Cahaba Resources, LLC
Rockcastle Mine No. 1
ASMC: P-3999

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Cahaba Resources, LLC
Rockcastle Mine No. 1
ASMC: P-3999

HUC: 031601120303
NPDES: AL0076589

As required under Federal Public Law 95-87, Section 510(b)(3), the Alabama Surface Mining Commission (ASMC) must find in writing the following proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The applicant must submit a determination of probable hydrologic consequences of mining and reclamation operations in Part II.H of the permit application for areas both on and off the mine site. This determination will allow the ASMC to assess probable cumulative impacts of all anticipated mining activities on the surface and ground water hydrology of the permit and adjacent areas as stated in Federal Public Law 95-87, Section 507(b)(11) and ASMC Rule 880-X-8E-.06(1)(g). The following assessment and findings are intended to fulfill the above.

I. GENERAL INFORMATION

The proposed Cahaba Resources, LLC P-3999 is for a surface coal mining operation encompassing 204.0 acres including mining acres and haul/access roads, impoundments, stockpiles, equipment storage areas and diversion ditches.

The proposed mine site is located in part of Section 19, Township 20 South, Range 6 West and part of Section 24, Township 20 South, Range 7 West, Tuscaloosa County, Alabama as seen from the Abernant Alabama USGS 7.5 minute Quadrangle.

This permit area is located in the Whiteoak Creek – Davis Creek sub-watershed area. It is located southwest of Abernant and north of Alabama Highway 216. See Map No. 1 for the general area.

A. Geology of the Warrior Coal Basin

The Pottsville Formation of Early and Middle Pennsylvanian age in Alabama is divided into four fields: the Warrior, Cahaba, Coosa and Plateau fields. All fields were once connected by an unbroken area of coal measures, however separation occurred as a result of folding, faulting and erosion of uplifted areas.

The Warrior coal field is a gently folded or flat-lying area classified as the Cumberland Plateau. It lies in a large, gentle monoclinal structure that extends west into central Mississippi. The regional dip is towards the southwest. This regional southwest dip is interrupted by 2 anticlines (the Blue Creek anticline and the Sequatchie anticline) and three synclines or basins (the Blue Creek basin, Coalburg syncline and Warrior syncline).

The Warrior field has numerous normal faults that trend north and northwest up to 4 miles in length with up to 200 feet of displacement ("Geology of Coal Resources of the Coal-Bearing Rocks of Alabama, Alabama Geological Survey Bulletin 1182-B").

During the beginning of the Pennsylvanian age (approximately 323 million years ago), most of Alabama was part of a shallow, warm ocean basin. The transgressions and regressions of the seas lead to the rhythmic cycle of sandstone, underclay, coal beds, and shale with zones of marine and brackish water fossils that rest on the basal resistant conglomerate orthoquarzite of the Boyles sandstone formation. This sequence immediately repeats itself with similar rocks (marine shale, sandstone or clay, coal seam, freshwater shale and sandstone). This appears to show the rise of sea level, depositing marine sediments, then the falling of sea level allowing the coal producing forests to grow. This was followed by an influx of river deposited sands and muds, which would rapidly accumulate plant material. Then, the sea would rise again repeating the process.

At the end of the Pennsylvanian (approximately 299 million years ago), the uplift of the region and a dry climate marked the disappearance of the coastal coal swamps. During this period of uplift, no new sediments could be deposited for at least 200 million years. The gap in time between the Pennsylvanian deposition and the Cretaceous deposition resulted in an unconformity that allows for surface coal mining to exist in the Alabama coal fields.

B. Historical and Active Coal Mines

There are currently nine active permits and one expired permit within the in the Whiteoak Creek – Davis Creek sub watershed. The active mines include the Warrior Met Coal Mining, LLC P-3247 No. 7 Mine, P-3260 Mine No. 4, P-3906 Highway 59 Mine, and P-3927 Searles Mine No. 7; the Shannon, LLC P-3859 Shannon Mine; the Cahaba Resources P-3871 Davis Creek West Mine and P-3965 Weller Mine; and the Southland Resources, Inc. P-3966 Searles Mine No. 9 and P-3991 Searles Mine No. 10. The expired permit is the Southland Resources, Inc. P-3894 Searles Mine No. 5.

C. Anticipated Mining

There is potential for a mine to be permitted directly adjacent to the Rockcastle Mine No.1, called Rockcastle Mine No. 2. The proposed mining area is estimated to be 205 acres. Both Rockcastle Mine No. 1 and Rockcastle Mine No. 2 share the same surface water monitoring sites. This anticipated mine area is shown on Map No. 1.

II. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is that area, including the permit area, within which impacts resulting from the proposed operation may interact with the hydrologic impacts of all other past, current and anticipated coal mining on the surface and groundwater systems.

The CIA for surface water for Permit P-3999 (and including the anticipated mining) has been defined using a watershed approach due to the amount of mining within the watershed and the location of the mines. This will include all mining north of and including the P-3999 permit within the Whiteoak Creek – Davis Creek watershed (031601120303). This includes those areas of mining operations that may impact this assessment area affected by mining. See Map No. 2 for the CIA. See Table No. 1 for information on these permits.

The CIA for groundwater for this permit is limited to the general permit area itself. The CIA has been selected based upon the Department's assessment of the possible hydrologic impacts, which may occur as a result of mining operations. The subsurface hydrologic components considered in this assessment include all significant water-bearing units in, and within the vicinity of, the proposed permit. No cumulative impacts to groundwater are expected due to the lack of a widespread, regional aquifer system.

A. Geologic/Hydrogeologic Information

i. Geology

The proposed P-3999 permit area is located in the Warrior Basin of the Appalachian Plateaus Physiographic Province. The area is underlain by the Pottsville Formation, and pre-Pennsylvanian rocks. The Pottsville Formation consists of alternating beds of gray sandstone, conglomerate, siltstone, and shale with beds of coal and underclay. The formation is thick in this area, approximately 4,500 feet. Except for the conglomeritic sandstone at the base of the formation, few lithologic horizons can be correlated regionally. (Hydrologic Assessment, Eastern Coal Province Area 23, Alabama USGS Water-Resources Investigations Open-File Report 80-683).

This mine site will remove the New Castle, Mary Lee, Blue Creek and Jagger seams of the Mary Lee Group. A majority of the permit area has been previously mined by pre-law mining, and there are abandoned underground mines within the Blue Creek and Jagger seams. These include the abandoned Yolande Coal and Coke Co. No. 2 Mine, the Thomas Furnace Co. Weller Mine and the New Connellsville Coal and Coke Co. Connellsville mines below portions of the permit in the Blue Creek coal seam and the abandoned Yolande Coal and Coke Co. No. 3 Mine below portions of the permit area in the Jagger coal seam.

ii. Potentially Acid- and Toxic-Forming Materials

Six drill holes were used to describe the lithology for the area, with four being used for overburden analysis (CR-1, CR-2, CR-5 and CR-6). Drill cuttings were taken every 5 ft. or change in lithology to at least 5 feet below the coal seam for analysis of potentially acid- and toxic forming properties. For these samples overburden analyses were conducted including paste pH, total sulfur, maximum potential acidity and neutralization potential in order to obtain the acid base account of the overburden. Potentially acid- and toxic-forming materials are those that exhibit a pH of less than 4.0 s.u. or a deficiency in calcium carbonate equivalent of at least 0 tons per 1,000 tons of material (T/KT).

iii. Surface Water

The proposed permit area is located in the Warrior River Basin and is drained by Davis Creek and Texas Creek. All of these streams are classified as "Fish and Wildlife" where the sediment basins discharge into them. Surface water from the permit area will be routed through seven sediment basins, in accordance with the (ADEM) National

Pollution Discharge Elimination System (NPDES) permit AL0076589. The basins are proposed as temporary structures.

According to 335-6-11-.02, "use classifications apply water quality criteria adopted for particular uses based on existing utilizations, uses reasonably expected in the future, and those uses not now possible because of correctable pollution but which could be made if the effects of pollution were controlled or eliminated. Of necessity, the assignment of use classifications must take into consideration the physical capability of waters to meet certain uses."

To characterize the existing quality and quantity of water within Davis Creek and Texas Creek, baseline data were obtained and submitted in the permit application. Surface water monitoring site SW-1 is located upstream of the mine site on Texas Creek with a drainage area of 1.23 mi^2. Surface water monitoring site SW-2 is located upstream on Davis Creek with a drainage area of 17.38 mi^2. Surface water monitoring site 7-15 is located downstream on Davis Creek with a drainage area of 45.68 mi^2. Table 2 included at the end of this assessment presents the baseline data. The surface water monitoring sites are shown on Map No. 1.

A previously established surface water site for the Cahaba Resources, LLC Davis Creek West Mine (ASMC P-3871) will be utilized as the CHIA assessment point for this permit. Surface water site P3871 SW-8198-1 is located downstream on Davis Creek where Davis Creek enters into the Warrior River. It drains approximately 70,498 acres (110.2 mi^2) and has been monitored since at least 2004.

iv. Ground Water

According to the "Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama, Area 6" by the U.S. Geological Survey, Water-Resources Investigations Report 87-4113, "the Pottsville Formation consists chiefly of sandstone, conglomerate, siltstone, and shale with beds of coal and underclay. Water in the Pottsville aquifer occurs under confined conditions due to sharp contrast in permeability within the aquifer. Groundwater usually occurs at depths of less than 200 feet in secondary features such as openings along fractures and bedding planes. Only small amounts of groundwater suitable for domestic use are available in the weathered deposits. The quantity of water available to wells throughout the aquifer depends on the size and extent of the water-bearing openings." Large water supplies are generally not available from the Pottsville Formation and no municipal wells tap the Pottsville Formation within the study area.

Rocks in the aquifer are tightly cemented and have little primary porosity and permeability. They contain water in secondary features and solutioning is not an effective agent for the enhancement of secondary features due to its silicic lithology (as compared to carbonate aquifers in the area). Due to the folded and faulted geologic structure, the Pottsville Formation is not continuous from one area to another. Groundwater movement between aquifers is restricted due to the confining beds, and

movement within the aquifer generally is from hills and highland areas to streams and other areas of natural discharge.

The Coker Formation consists of a basal nonmarine zone of gravel, marine sand and clay. A clay zone is usually present at the top of the Coker. In areas where the Coker is less than 100 feet thick, only the basal beds remain. Also, the Coker is not used extensively downdip where shallower aquifers are available.

According to the Hydrologic Assessment, Eastern Coal Province Area 23, Alabama by the US Geological Survey Water-Resources Investigations Open-File Report 80-683, rain is the source of groundwater in the area. Annual rainfall averages 54 inches per year, which nearly 5 percent of recharges the ground water reservoirs. According to the "Hydrologic Assessment, Eastern Coal Province Area 23", groundwater movement generally is to the southwest. The Coker Formation dips toward the southwest about 30 feet per mile and the water moves through the more permeable lower part which contains sand and gravel beds and overlies the Pottsville Formation.

Little is known about recharge and ground water movement in the Pottsville Formation; however, according to the permit application, the main direction of water is towards the northwest, in the coal dip direction. Underground mining and faulting have most likely altered the groundwater movement direction and mechanisms for movement. Water may move in other directions based on topographic features of the area or fracture systems in the formation. Also because of the perched water tables and irregular lensing properties of the Pottsville Formation outside of the permit area, water levels are unpredictable and areal correlations are only possible within short distances.

Ground water in the Pottsville occurs in sandstone beds and in fractures and bedding planes. The openings are small, and yield to wells range from less than 10 gal/min to as much as 50 gal/min. The depth to water is generally less than 30 feet in stream valleys and more than 50 feet in hills and ridges.

Domestic Wells

A well inventory of the proposed permit area revealed ninety seven residences within a ½ mile radius of the proposed permit site. There are three residences with wells, however only one residence uses their well as a primary water source. The resident would not give well information or a sample.

Company Installed Wells

No groundwater wells were installed for this permit. Baseline monitoring was not conducted due to the dip of the coal (between 19 and 26 degrees northwest), extensive underground mining in and adjacent to the permit area and the faulting in the area.

B. Coal Processing Waste

Coal processing waste (gob and slurry) will not be generated or disposed of at the site.

C. Material Damages

With respect to the CHIA, material damage to the hydrologic balance means the changes to the hydrologic balance caused by surface mining and reclamation operations to the extent that these changes would significantly affect present and potential uses as designated by the regulatory authority. This includes the hydrologic impact that results from the cumulation of flows from all coal mining sites in a cumulative impact area. Examples of material damage are: permanent destruction of a major regional aquifer; temporary contamination of an aquifer in use that cannot be mitigated; and solute contributions to streams above receiving stream standards.

A CHIA is based on the best currently available data and is a prediction of mining-related impacts to the hydrologic balance. Permittees (and permit applicants) are required to monitor water quality and quantity. Exceeding material damage thresholds might also cause significant reduction of the capability of an area to support aquatic life, livestock and wildlife communities.

III. FINDINGS

Based on the information presented above, the following findings have been made relative to the proposed permit area.

A. Potentially Acid- and Toxic-Forming Materials

Laboratory analyses of the bedrock overlying the Jagger coal seam show that the overburden at the Rockcastle Mine No.2 contains excess tons/acre of neutralization potential; a range of neutralization potential of +520 – +4907 (tons $CaCO_3$/1000 tons overburden) , and an acid-base account average of +9.63. It should be noted that an acid base account is not a water quality prediction tool, but instead is used to support the ability of vegetation to be established and supported. According to the "Coal Mine Drainage Prediction and Pollution Prevention in Pennsylvania" publication by the Pennsylvania Department of Environmental Protection, excess neutralization potential most likely produces alkaline drainage.

The materials handling plan included in the permit application will require any potentially acid- and toxic-forming strata encountered (such as spoiled coal) to be covered with a minimum of four feet of non-toxic, non-combustible earthen material. Also, this material may not be placed within the root zone. The material will undergo relatively quick burial that will restrict the development of acid-forming conditions.

The sulfur percentages are very low in the overburden analysis, which is a major constituent in the acid-forming process. Such low sulfur values are a good indicator of inability for the acid forming process to begin.

B. Surface Water

Based on laboratory analysis of the samples collected at surface the three surface water monitoring sites Texas Creek and Davis Creek, the surface water quality near the Rockcastle Mine No. 1 contains low TSS, near neutral pH, low concentrations of iron and low concentrations of manganese. The surface water quality downstream on Davis Creek at site 7-15 shows times of varying concentrations of elevated sulfates and conductivity, especially from mid-2009 through the end of 2015 (data taken from the Cahaba Resources, LLC Davis Creek West Mine ASMC P-3871 quarterly monitoring). While elevated conductivity and sulfates can be attributed to mining activities, they also can be attributed to any disturbance of natural ground from agriculture to rural and urban development.

Further research into water quality analysis in the Whiteoak Creek – Davis Creek Watershed shows very elevated conductivity concentrations on Black Branch and Cane Creek, which are tributaries to Davis Creek. The Cane Creek headwaters begin downslope of pre-law mining, and also drain area from the Warrior Met Coal Mining, LLC Searles Mine No. 7 (ASMC P-3927). The Black Branch headwaters also begin near pre-law mining but also receive drainage from the Southland Resources, Inc. Searles Mine No. 5 (ASMC P-3894), the Warrior Met Coal Mining, LLC Mine No. 4 (ASMC P-3260) and the Warrior Met Coal Mining, LLC Searles Mine No. 7 (ASMC P-3927). During the period of elevated conductivity and sulfates downstream on Davis Creek from mid-2009 through the end of 2015, both Cane Creek and Black Branch also had elevated values. However, the conductivity concentrations downstream at Davis Creek have been decreasing since 2015, while the concentrations at both Cane Creek and Black Branch remain elevated. Chart No. 1 represents the P-3871-SW-8198-1 water data as date vs. conductivity. Charts 2 and 3 show the conductivity values by date at P-3927 downstream on both Cane Creek and Black Branch. It should be noted that while the sample dates for the downstream sites on Cane Creek and Black Branch are the same, they do not correspond to the sample dates for P-3871-SW-8198-1 downstream on Davis Creek.

Additional water quality analysis was preformed to determine a baseline for metals. A high flow and low flow sample was taken at each surface water monitoring site to analyze for Sb, As , Be, Cd, Cr, Cu, Pb, Ni, Se, Ag, Th, and Zn. The results of this analyses are shown in Table 3 and 3a.

A portion of this area has been previously disturbed by pre-law mining. Baseline water quality shows fluctuating, but near neutral pH values and low metals values which indicates that the overburden has sufficient alkaline material to neutralize any potential acidic conditions that could exist. Also this mining operation should lend to proper reclamation to help reduce increases in additional sulfate loads and conductivity concentrations.

Of the seven proposed ASMC sediments basins for this permit, one (Basin 035) will discharge into an unnamed tributary to Texas Creek. Sediment basins 015, 033, 032 and 031 will discharge into an unnamed tributary to Davis Creek, and sediment basins 012 and 011 will drain to Davis Creek.

Changes in the quantity and quality of the waters in the streams draining the site are expected to be minimal due to the proposed mining activities as well as the acres of mining versus the acres of the watershed (204 acres mining in 59989 acres of the Whiteoak Creek – Davis Creek watershed). The ratio of mining acres to watershed acres will be approximately 0.003%. During mining, runoff from the disturbed areas will be diverted into sediment basins that are designed to retain all settleable solids, skim and retain all floating solids, and provide adequate detention volume and time to minimize the contribution of suspended solids and dissolved solids into the receiving streams. Effluent from the sediment basins will be monitored by the permittee in accordance with NPDES permit requirements issued by ADEM. The effluent will be chemically treated, if necessary, in accordance with the NPDES permit. The basins will be monitored quarterly through final bond release in order to characterize and document any effects the mining may have on the surface-water hydrologic balance.
Post-Mining water quality and quantity estimates provided by the applicant are based on several factors:

1. Baseline surface water quality
2. Estimated impact during mining
3. Size of the permit area compared to the size of the watershed
4. Amount of previous mining within the watershed

According to the permit application, this mine site is expected to have a negligible increase in base flow, average flows, and peak flow rates relative to the baseline conditions. The NPDES maximum and average limitations set forth by ADEM for this mine site are as follows: pH limit is between 6.0 – 8.5 s.u., TSS maximum limit is 70 mg/L and the average is 35 mg/L, Fe maximum limit is 6.0 mg/L and the average is 3.0 mg/L and the Mn maximum limit is 4.0 with the average being 2.0 mg/L. Limits and monitoring requirements for these parameters can be found in both the Hydrologic Monitoring Plan for this permit, as well as the ADEM NPDES permit (AL0076589).

Any potentially acid- and toxic-forming materials will undergo relatively quick burial that will minimize exposure of the materials with the atmosphere; thus lessening the potential for Acid Mine Drainage to develop. This, along with the sediment basins, vegetation of the disturbed areas and erosion control practices should serve to lessen impacts to the streams and surface water bodies. Should any increase in mineralization occur in the surface waters as a result of the mining operations, it is anticipated the levels will diminish and return to pre-mining concentrations once mining and reclamation activities are complete. Table 4 shows the post-mining water quality projections based on the downstream site on Davis Creek (7-15).

C. Ground Water

The proposed operations are not expected to have a permanent adverse impact on the overall quality of the ground water at the site or surroundings. The main aquifer in this area is a sandstone unit located below the Jagger coal seam. Also, area has been pre-law mined, and due to the size of the proposed permit with respect to the watershed area any effects to

the groundwater system would be considered negligible in comparison. In addition, the area has been underground mined, which changes shallow groundwater flow significantly. According to published reports, deeper groundwater movement is in the south and west directions, however groundwater movement in this area is influenced by streams, as well as local surface topography.

IV. CONCLUSION

The assessment of probable cumulative impacts of the Cahaba Resources, LLC P-3999 Rockcastle Mine No. 1 finds the proposed operations have been designed to prevent material damage to the hydrologic balance outside the proposed permit area.

Table 1
Mining Operations in the Cumulative Impact Area
P-3999

Permit No.	Permittee	Permit Name	Date Issued	Acres*	Description	Coal Seam(s)	Status**
P-3247	Warrior Met Coal Mining, LLC	No. 7 Mine	03/03/1983	1773	Underground Mine	Blue Creek	Active Coal Being Removed
P-3260	Warrior Met Coal Mining, LLC	Mine No. 4	03/03/1983	2312	Preparation Plant	Varies	Active Coal Being Removed
P-3859	Shannon, LLC	Shannon	11/02/2004	1364	Area Mining	New Castle Blue Creek Jagger	Temporary Cessation of Operations
P-3871	Cahaba Resources, LLC	Davis Creek West Mine	05/31/2007	753	Area Mining	Clements (Utley) Brookwood Johnson (Carter)	Reclamation Activities
P-3906	Warrior Met Coal Mining, LLC	Highway 59 Mine	06/11/2009	192	Area Mining	Brookwood Milldale Johnson (Carter)	Active Non Producing
P-3927	Warrior Met Coal Mining , LLC	Searles Mine No. 7	08/28/2009	127	Area Mining	Broken Arrow Brookwood Milldale Johnson (Carter)	Reclamation Activities
P-3965	Cahaba Resources, LLC	Weller Mine	12/04/2012	523	Area Mining	Gillespie New Castle Mary lee Jagger	Active Coal Being Removed
P-3966	Southland Resources, Inc.	Searles Mine No. 9	01/08/2013	248	Area Mining	Broken Arrow Brookwood Milldale Johnson (Carter)	Active Coal Being Removed
P-3991	Southland Resources, Inc.	Searles Mine No. 10	07/24/2018	160	Area	Broken Arrow Brookwood Milldale Johnson(Carter)	Active Coal Being Removed
P-3894	Southland Resources, Inc.	Searles Mine No. 5	12/04/2007	427	Area	Broken Arrow Brookwood Milldale Johnson (Carter)	Expired Reclamation Activities

*Acres at time of P-3999 issuance
**Status taken from ASMC General Field Inspection Reports

Table 2
Ranges/Averages of Surface-Water Quality/Quantity
Stream Points
P-3999

Parameter	SW-1 Upstream on Texas Creek	SW-2 Upstream on Davis Creek	7-15 Downstream on Davis Creek
Drainage Area	1.23 mi^2	17.38 mi^2	45.68 mi^2
Discharge Rate (cfs)	0.25 – 12.39 (3.81)	4.08 – 127.5 (57.5)	0.13 – 159.06 (35.9)
Field pH (S. U.)	6.82 – 8.22	6.82 – 7.98	6.89 – 8.21
Total Suspended Solids (mg/L)	1 - 9 (5)	1 - 18 (6)	1 - 29 (5.6)
Total Iron (mg/L)	0.25 – 1.61 (0.60)	0.41 – 3.84 (1.03)	0.13 – 0.72 (0.40)
Total Manganese (mg/L)	BML – 0.41 (0.10)	BML – 0.38 (0.11)	0.04 – 0.28 (0.15)
Specific Conductivity 25 ^0C (μmhos/cm)	36.2 – 195.8 (90.9)	56.3 – 259 (115.7)	207 – 3354 (1513)
Acidity (mg/L)	0 - 15 (7.9)	6 - 29 (10.3)	NA
Alkalinity (mg/L)	4 - 91 (28.1)	17 - 81 (36.3)	NA
Sulfates (mg/L)	BML – 9 (5.9)	BML - 8 (3.5)	NA

Average values are set in parentheses.
Averages calculated as geometric means.
UT = unnamed tributary
BML = Below Measurable Limits
NA = Not Analyzed (Quarterly performance monitoring data).

Table 3
Low-Flow Metals Analysis
P-3999
6/26/20018

Parameter	**SW-1**	**SW-2**	**7-15**
Flow	**0.25 CFS**	**4.08 CFS**	**0.13 CFS**
Sb (µg/L)	BML	BML	BML
As (µg/L)	BML	BML	0.39
Be (µg/L)	BML	BML	BML
Cd (µg/L)	BML	BML	BML
Cr (µg/L)	BML	BML	BML
Cu (µg/L)	0.94	2.15	BML
Pb (µg/L)	BML	BML	BML
Ni (µg/L)	BML	BML	BML
Se (µg/L)	BML	BML	BML
Ag (µg/L)	1.03	BML	BML
Tl (µg/L)	BML	BML	BML
Zn (µg/L)	BML	BML	BML

BML – Below Measurable Limits

Table 3a.
High-Flow Metals Analysis
P-3999
3/12/2018

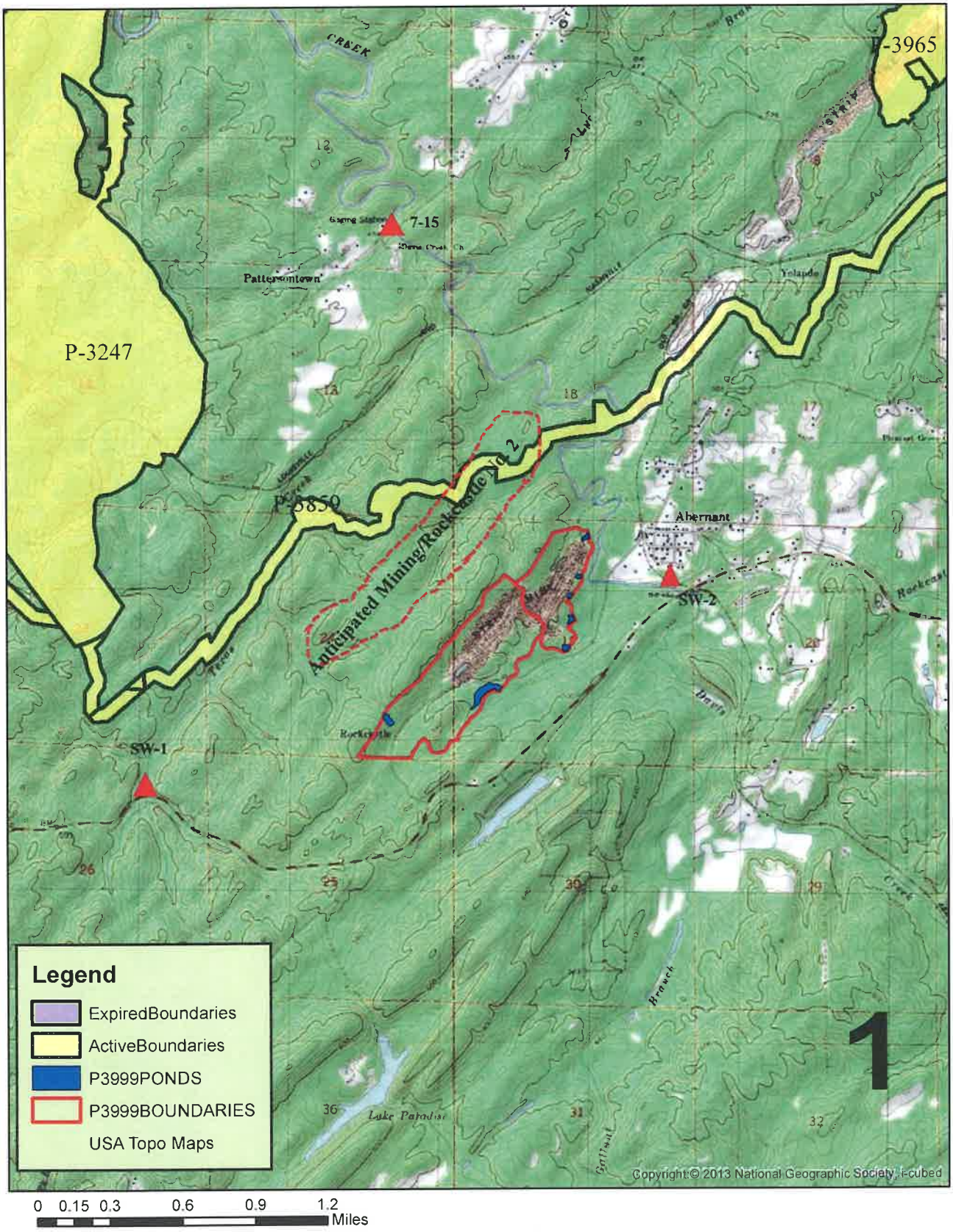
Parameter	**SW-1**	**SW-2**	**7-15**
Flow	**12.24 CFS**	**127.5 CFS**	**159.06 CFS**
Sb (µg/L)	BML	BML	BML
As (µg/L)	BML	0.46	0.39
Be (µg/L)	BML	BML	BML
Cd (µg/L)	BML	BML	BML
Cr (µg/L)	BML	BML	BML
Cu (µg/L)	0.94	2.31	BML
Pb (µg/L)	BML	0.70	BML
Ni (µg/L)	BML	BML	BML
Se ((µg/L)	BML	2.41	BML
Ag (µg/L)	1.03	BML	BML
Tl (µg/L)	BML	BML	BML
Zn (µg/L)	BML	BML	BML

BML – Below Measurable Limits

Table 4
Estimate of Post-Mining, Average Event
Cahaba Resources, LLC
P-3999

Parameter	**Estimated Value 7-15 on Davis Creek**
Flow (cfsm)	1.55
pH (s.u.)	7.63
Iron (mg/L)	0.41
Manganese (mg/L)	0.16
Specific Conductivity 25 ^{0}C (μmhos)	1097
TSS (mg/L)	5

Map No. 1
Cahaba Resources, LLC
Rockcastle Mine No. 1 P-3999



Map No. 2
Cahaba Resources, LLC
Rockcastle Mine No. 1 P-3999

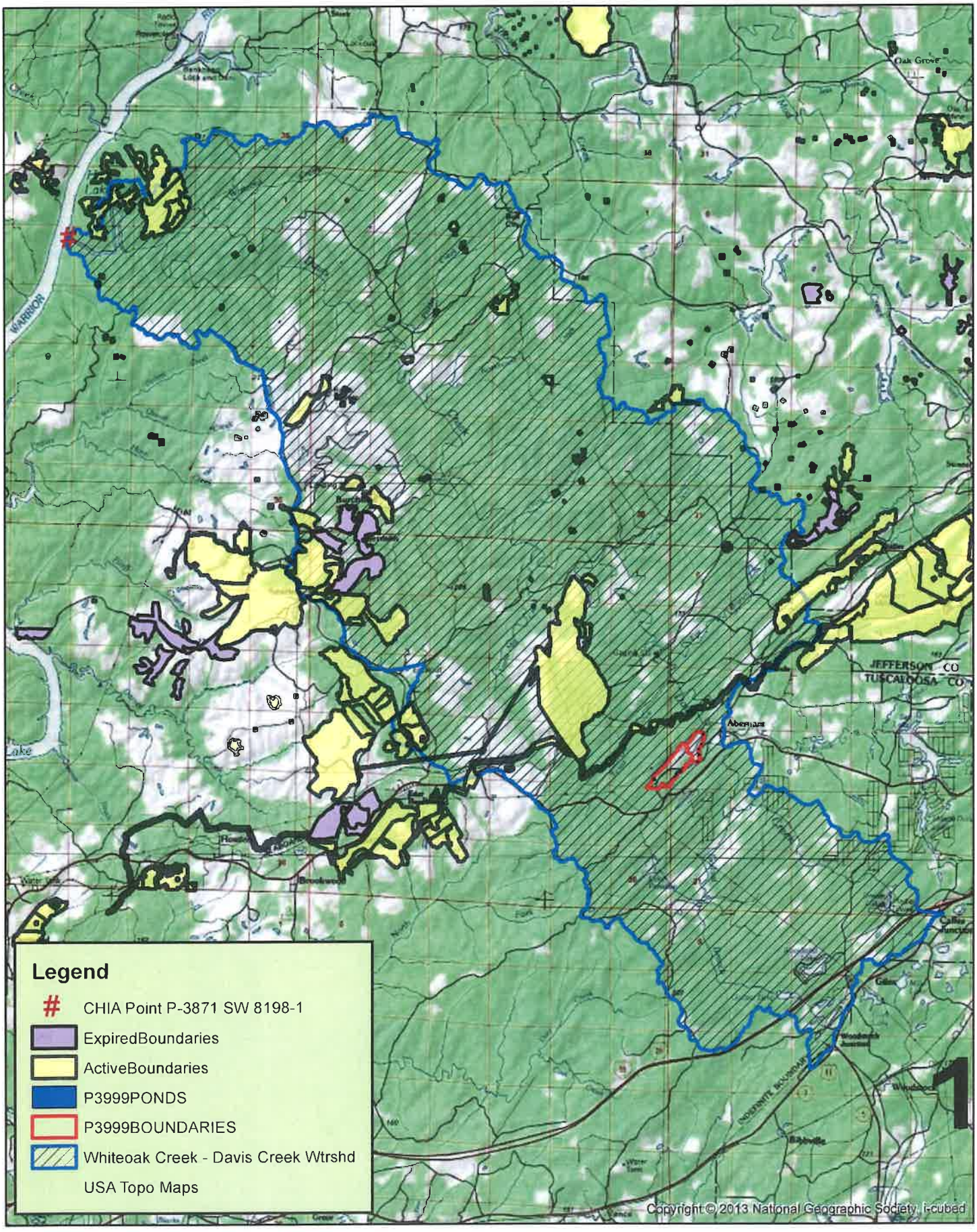


Chart No. 1

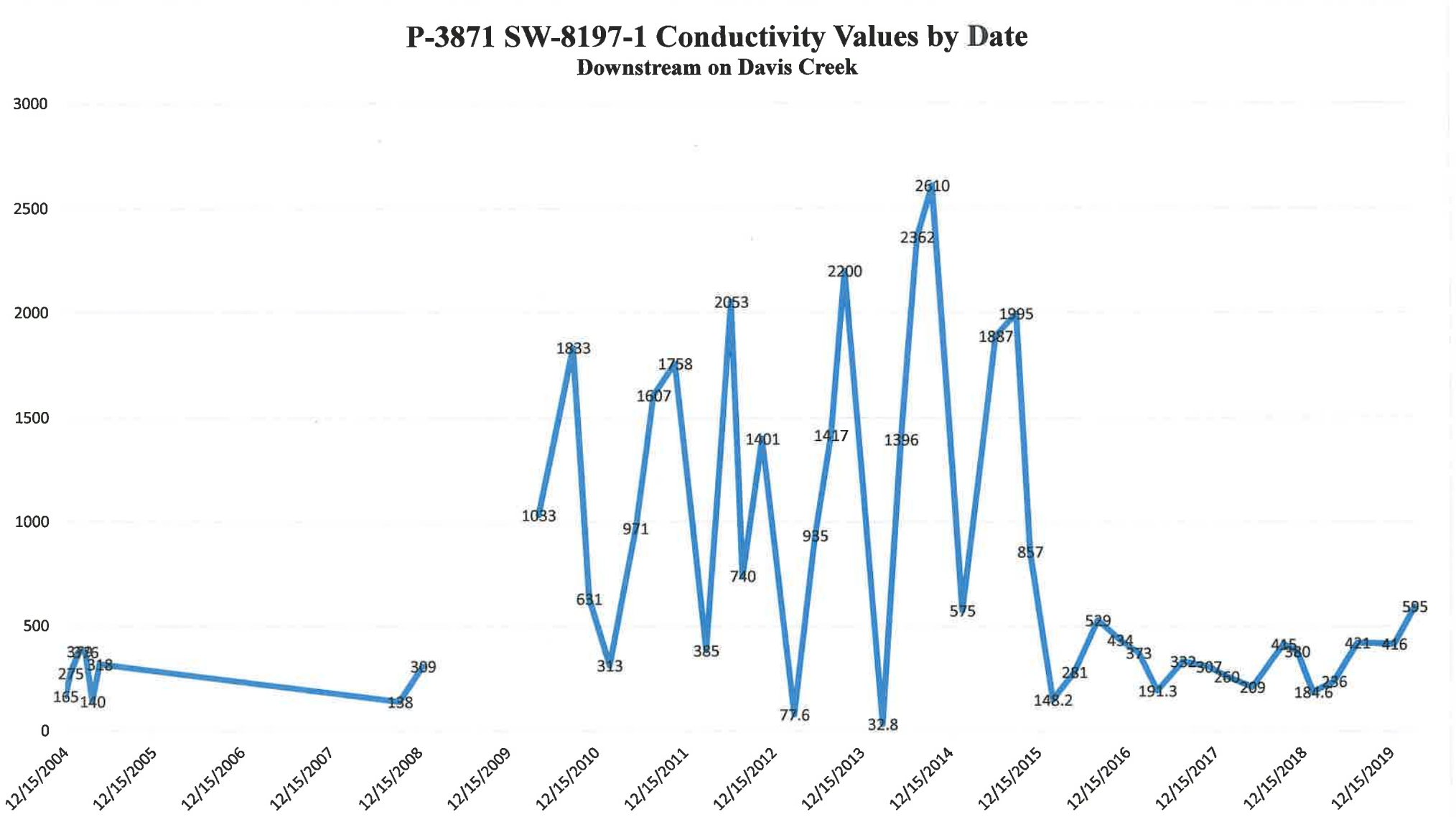

P-3871 SW-8197-1 Conductivity Values by Date
Downstream on Davis Creek
3000
2500
2000
1500
1000
500
0
12/15/2004
12/15/2005
12/15/2006
12/15/2007
12/15/2008
12/15/2009
12/15/2010
12/15/2011
12/15/2012
12/15/2013
12/15/2014
12/15/2015
12/15/2016
12/15/2017
12/15/2018
12/15/2019
165
275
376
318
140
309
138
1033
1833
631
313
971
1607
1758
385
2053
740
1401
77.6
935
1417
2200
32.8
1396
2362
2610
575
1887
1995
857
148.2
281
529
434
373
191.3
332
307
260
209
445
380
184.6
236
421
416
595

Chart No. 2

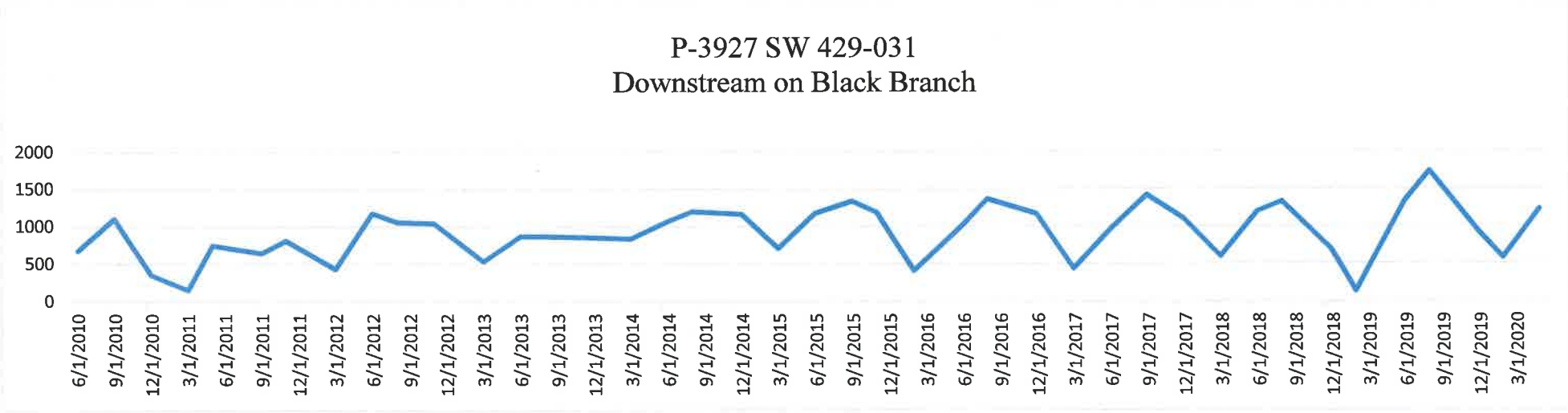


Chart No. 3